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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/588,791

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Mitsuru Suzuki

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EXAMINER

KIM, HEE-YONG

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/588,791	Applicant(s) SUZUKI ET AL.	
	Examiner HEE-YONG KIM	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/7/2007 and 8/9/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claim 4** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim cites "level of advantage on specification" in the line 11. However, it is not clear about whether specification is encoder's specification or decoder's or some standard. The examiner read it as spec says: "specification of decoding apparatus at the destination" (paragraph 129).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 2-3, 5-6** are rejected as being unpatentable over Watkins (US 6,507,672), hereafter referenced as Watkins.

Regarding **claim 2**, in the same field of endeavor, Watkins discloses Video Encoder for Digital Video Displays. Watkins specifically discloses An image coding apparatus comprising: a coding circuit (Fig.4 Multimedia Encoder) which codes

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(encode, col.1, line 32) an image signal (a frame, col.1, line 32) to be coded, by using intra-frame coding scheme (Intra frame, col.2, line 27-43) and/or inter-frame coding scheme (Predicted Frame and Bi-directional frame, col.2, line 27-43).

However Watkins fails to disclose a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus, wherein said reference mode selection circuit sets the reference mode, according to whether the reference mode that uses the bidirectional coding or the reference mode that does not use the bidirectional coding is more suitable for the coding execution environment in said apparatus, with reference to a level of compression ratio.

Watkins further discloses that P frames receives a fairly high amount of compression, but Bi-directional pictures has the greatest amount of compression and requires both a past and a future references (col.2, line 27-43).

Therefore, given this teaching, it would have been obvious to one skilled in the art to modify Watkins to provide a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus, wherein said reference mode selection circuit sets the reference mode, according to

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whether the reference mode that uses the bidirectional coding or the reference mode that does not use the bidirectional coding is more suitable for the coding execution environment in said apparatus, with reference to a level of compression ratio, in order to adaptively select P or B frames according to compression ratio requirement. The Watkins Multimedia Encoder, incorporating adaptive selection of P or B frames according to compression ratio requirement, has all the features of claim 2.

Regarding **claim 3**, Watkins discloses Video Encoder for Digital Video Displays. Watkins specifically discloses An image coding apparatus comprising:
a coding circuit (Fig.4 Multimedia Encoder) which codes (encode, col.1, line 32) an image signal (a frame, col.1, line 32) to be coded, by using intra-frame coding scheme (Intra frame, col.2, line 27-43) and/or inter-frame coding scheme (Predicted Frame and Bi-directional frame, col.2, line 27-43).

However, Watkins fails to disclose a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus,
wherein said reference mode selection circuit sets the reference mode, according to whether the reference mode that uses the bidirectional coding or the reference mode that does not use the bidirectional coding is more suitable for the coding execution environment in said apparatus, with reference to a level of load caused by a coding process.

Watkins further discloses encoding P and B frames using dynamic search area (Motion search) in order to avoid failure of encoder due to computational load (col.10, line 25-46). But the same goal can be achieved by selecting P and B frames because a B frame has two times more computation for motion vector search than P frames since it has two reference frames instead of one.

Therefore, given this teaching, it would have been obvious to one skilled in the art to modify Watkins to provide a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus, wherein said reference mode selection circuit sets the reference mode, according to whether the reference mode that uses the bidirectional coding or the reference mode that does not use the bidirectional coding is more suitable for the coding execution environment in said apparatus, with reference to a level of load caused by a coding process, in order to avoid failure of encoder due to computational load. The Watkins Multimedia Encoder, incorporating adaptive selection of P or B frames according to computational load, has all the features of claim 3.

Regarding **claim 5**, Watkins discloses everything claimed as applied above (see claim 2). Watkins further discloses wherein as the coding scheme said coding circuit (Fig.4 Multimedia Encoder) codes (encode, col.1, line 32) the image signal (a frame, col.1, line 32) by using a scheme complying with MPEG (MPEG, col.2, line 10-19)

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in the reference mode that uses a bidirectional coding (Encoder including I, P, B frame coding), the coding is performed using I pictures (Intra frame, col.2, line 27-43), P pictures and B pictures (Predicted Frame and Bi-directional frame, col.2, line 27-43), and in the reference mode that does not use (inherent in Watkins because Watkins has a choice of encoding without B frame) the bidirectional coding, I pictures and P pictures are used.

Regarding **claim 6**, Watkins discloses everything claimed as applied above (see claim 2). Watkins further discloses An image pickup apparatus (Video Buffer 414 and RISC CPU 410, Fig.4), comprising:

an image input unit (Video Buffer 414, Fig.4) which takes an image of an object and acquires an image signal (Digital Video, Fig.4);

an image coding apparatus (Fig.4 Multimedia Encoder) according to Claim 2, which codes the image signal (encode a frame, col.1, line 32); and a data storage unit (Bitstream Buffer 416, Fig.4) which stores coded data (bitstream) generated by the coding.

5. **Claim 4** is rejected as being unpatentable over Watkins in view of Ten (US 6,542,549), hereafter referenced as Ten.

Regarding **claim 4**, Watkins discloses Video Encoder for Digital Video Displays. Watkins specifically discloses An image coding apparatus comprising:

a coding circuit (Fig.4 Multimedia Encoder) which codes (encode, col.1, line 32) an image signal (a frame, col.1, line 32) to be coded, by using intra-frame coding scheme

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(Intra frame, col.2, line 27-43) and/or inter-frame coding scheme (Predicted Frame and Bi-directional frame, col.2, line 27-43).

However, Watkins fails to disclose a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus, wherein said reference mode selection circuit sets the reference mode, according to whether the reference mode that uses the bidirectional coding or the reference mode that does not use the bidirectional coding is more suitable for the coding execution environment in said apparatus, with reference to a level of advantage on specifications in a case when the bidirectional coding is performed on the image signal.

However, in the analogous field of endeavor, Tan discloses Method and Model for Regulating the Computational and Memory Requirements of a Compressed Bitstream in a Video Encoder. Tan specifically discloses encoder regulating complexity requirements of bitstream in order to ensure decoder conforming to the complexity specification of the standard without running short of resources (col.1, line 9-17). So, if it is known that the decoder conforms simple profile at main level which cannot decode B frame (well known in MPEG standard), the encoder should not generate B frames. Or if the decoder conforms main profile at main level, the encoder generates B frame to take advantage of decoder's capability.

Therefore, given this teaching, it would have been obvious to one skilled in the art to modify Watkins to provide a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus, wherein said reference mode selection circuit sets the reference mode, according to whether the reference mode that uses the bidirectional coding or the reference mode that does not use the bidirectional coding is more suitable for the coding execution environment in said apparatus, with reference to a level of advantage on specifications of decoder at the destination in a case when the bidirectional coding is performed on the image signal, in order to ensure decoder conforming to the complexity specification of the standard without running short of resources. The Watkins Multimedia Encoder, incorporating adaptive selection of P or B frames according to specifications of decoder at the destination, has all the features of claim 4.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, because they are related to the subject matter such as encoding video.

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- US 6,493,392: Chung et al. disclose "Method for Coding Digital interlaced Moving Picture".

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HEE-YONG KIM whose telephone number is (571)270-3669. The examiner can normally be reached on Monday-Thursday, 8:00am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571-272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HEE-YONG KIM/
Examiner, Art Unit 2621

/Marsha D. Banks-Harold/
Supervisory Patent Examiner, Art Unit 2621

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/Andy S. Rao/

Primary Examiner, Art Unit 2621

March 14, 2010